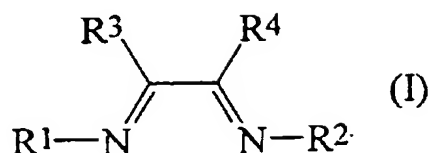


AS ENCLOSED TO IPER

We claim:

- 5 1. A 1,2-diimine of the formula (I),



where the symbols have the following meanings:

10

R¹ is a radical of the formula NR⁵R⁶,

R² is a radical of the formula NR⁵R⁶ or an alkyl, aryl or cycloalkyl radical,

15

R⁵ and R⁶ together with the N atom form a 5-, 6- or 7-membered ring in which one or more of the -CH- or -CH₂- groups may be replaced by appropriate heteroatom groups and which may be saturated or unsaturated and unsubstituted, substituted or fused with further carbocyclic or heterocyclic 5- or 6-membered rings which may in turn be saturated or unsaturated or substituted or unsubstituted,

20

and

25

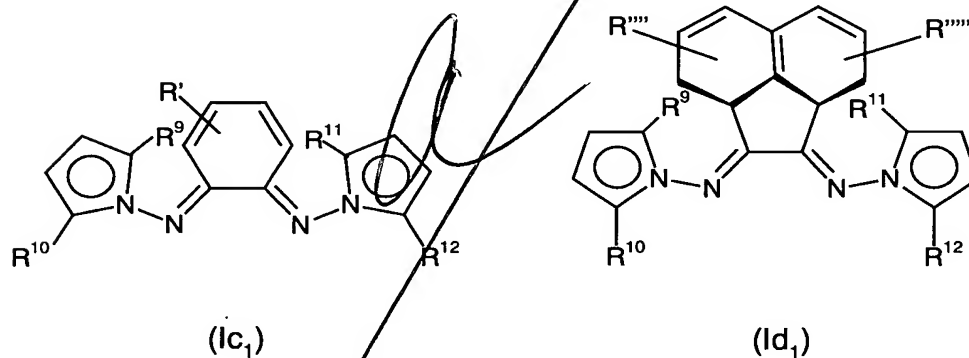
R³ and R⁴ together with the two imine carbon atoms form a carbocyclic or heterocyclic 5- to 8-membered ring which may be saturated or unsaturated and unsubstituted, substituted or fused with further carbocyclic or heterocyclic 5- or 6-membered rings which may in turn be saturated or unsaturated and substituted or unsubstituted.

30

2. A compound as claimed in claim 1, wherein the radicals of the formula NR⁵R⁶ are pyrrole radicals or radicals derived from pyrrole, where one or

more -CH- groups in the pyrrole ring may be replaced by nitrogen, which may be unsubstituted, substituted or fused with further carbocyclic or heterocyclic 5- or 6-membered rings which may in turn be saturated or unsaturated and substituted or unsubstituted.

3. A compound as claimed in claim 2, wherein the pyrrole radicals or radicals derived from pyrrole are substituted in the 2 and 5 positions by C1-C6-alkyl groups, which may be linear, branched or substituted by heteroatoms, and/or aryl groups which may be unsubstituted or in turn substituted by C1-C6-alkyl groups which may be heteroatom-substituted.
4. A compound as claimed in claim 3 which has one of the formulae (Ic1) or (Id1):



where R₉, R₁₀, R₁₁ and R₁₂ are, independently of one another, C1-C6-alkyl radicals

and

R', R''', R'''' are H or alkyl, cycloalkyl or aryl.

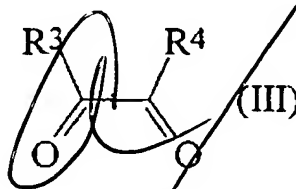
5. A process for preparing symmetrical compounds of the formula (I) as claimed in claim 1 in which R₁ = R₂ by reacting compounds of the formula (II)



where

R5 and R6 together with the N atom form a 5-, 6- or 7-membered ring in which one or more of the $-\text{CH}-$ or $-\text{CH}_2-$ groups may be replaced by appropriate heteroatom groups and which may be saturated or unsaturated and unsubstituted, substituted or fused with further carbocyclic or heterocyclic 5- or 6-membered rings which may in turn be saturated or unsaturated or substituted or unsubstituted,

with 1,2-diketo compounds of the formula (III),



where

R3 and R4 together with the two carbonyl carbon atoms form a carbocyclic or heterocyclic 5- to 8-membered ring which may be saturated or unsaturated and unsubstituted, substituted or fused with further carbocyclic or heterocyclic 5- or 6-membered rings which may in turn be saturated or unsaturated and substituted or unsubstituted,

in a single-stage process under acidic reaction conditions in alcoholic solution or in the presence of a trialkylaluminum catalyst in an aprotic solvent in a ratio of the compound of the formula (II) to the compound of the formula (III) of 2:0.7-1.3.

6. A process for preparing unsymmetrical compounds of the formula (I) as claimed in claim 1 in which $\text{R}_1 \neq \text{R}_2$ in a two-stage process in which:

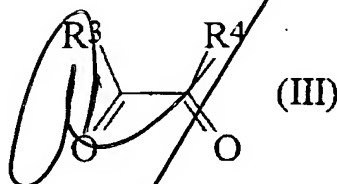
a) compounds of the formula (II)



where

R₅ and R₆ together with the N atom form a 5- or 6-membered ring in which one or more of the -CH- or -CH₂- groups may be replaced by appropriate heteroatom groups and which may be saturated or unsaturated and unsubstituted, substituted or fused with further carbocyclic or heterocyclic 5- or 6- membered rings which may in turn be saturated or unsaturated or substituted or unsubstituted,

are reacted in a first step with 1,2-diketo compounds of the formula (III)



where

R₃ and R₄ together with the two carbonyl carbon atoms form a carbocyclic or heterocyclic 5- to 8-membered ring which may be saturated or unsaturated and unsubstituted, substituted or fused with further carbocyclic or heterocyclic 5- or 6-membered rings which may in turn be saturated or unsaturated and substituted or unsubstituted,

in a ratio of the compounds of the formula (II) to the compounds of the formula (III) of 1:0.8-1.2 under acidic conditions in alcoholic solution to form the corresponding monoimine and the solvent is subsequently removed under reduced pressure,

and

- b) the monoimine is reacted in a second step with compounds of the formula (II) which are different from the compounds of the formula (II) used in step a), or with compounds of the formula (IV)



where R7 and R8 are, independently of one another, alkyl, aryl or cycloalkyl radicals, or

with amines of the formula (V)

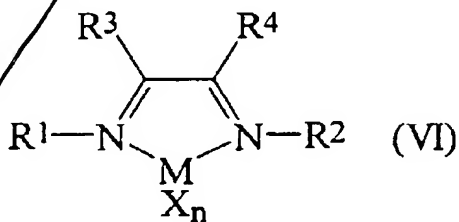


where

R13 is an alkyl radical, an aryl radical or a cycloalkyl radical,

in an aprotic solvent, in the presence of a trialkylaluminum catalyst, in a ratio of the monoimine to a compound of the formula (II) of the formula (IV) or (V) of 1:0.8-1.2.

7. A compound of the formula (VI),



where the symbols having the following meanings:

R1 is a radical of the formula NR5R6,

R2 is a radical of the formula NR₅R₆ or an alkyl, aryl or cycloalkyl radical,

5 R5 and R6 together with the N atom form a 5-, 6- or 7-membered ring in which one or more of the -CH- or -CH₂- groups may be replaced by appropriate heteroatom groups and which may be saturated or unsaturated and unsubstituted, substituted or fused with further carbocyclic or heterocyclic 5- or 6-membered rings which may in turn be saturated or
10 unsaturated or substituted or unsubstituted,

and

15 R3 and R4 together with the two imine carbon atoms form a carbocyclic or heterocyclic 5- to 8-membered ring which may be saturated or unsaturated and unsubstituted, substituted or fused with further carbocyclic or heterocyclic 5- or 6-membered rings which may in turn be saturated or unsaturated and substituted or unsubstituted;

20 M is a transition metal of group 8, 9 or 10 of the Periodic Table of the Elements,

and

25 X is a halide or a C₁-C₆-alkyl radical;

n is the valence of the metal M.

30 8. A compound as claimed in claim 7, wherein M = Pd or Ni and n = 2 or 3.

9. A process for preparing compounds of the formula (VI) as claimed in claim 7 by reacting corresponding compounds of the formula (I) with salts of transition metals of groups 8, 9 and 10 of the Periodic Table of the
35 Elements.

10. The use of a compound of the formula (VI) as claimed in claim 7 as catalyst in a process for the polymerization of unsaturated compounds.
- 5 11. A process for preparing polyolefins by polymerization of unsaturated compounds in the presence of an activator and a compound of the formula (VI) as claimed in claim 7 as catalyst.
- 10 12. A process as claimed in claim 11, wherein the catalyst is present in homogeneous form in solution or in heterogeneous form immobilized on a support in the polymerization.
- 15 13. A process as claimed in claim 11 or 12, wherein methylaluminoxane or N,N-dimethylanilinium tetrakis(pentafluorophenyl)borate is used as activator.
14. A process as claimed in any of claims 11 to 13, wherein an unsaturated compound or a combination of unsaturated compounds selected from among ethylene, C3-C20-monoolefins, cycloolefins and propylene is used.

add
a: